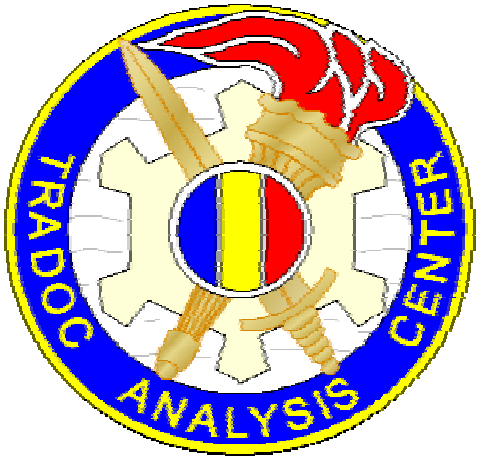
DMSO
Industry Days 2000



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Analysis Mission

Changing Environment

1. Military problem set is different, complicated by an *asymmetric and adaptive adversary*.

2. Military solution set leverages IT, thereby placing more emphasis on *human dimension*.

3. Pace of development of new military concepts requires greater investment of *intellectual capital*.

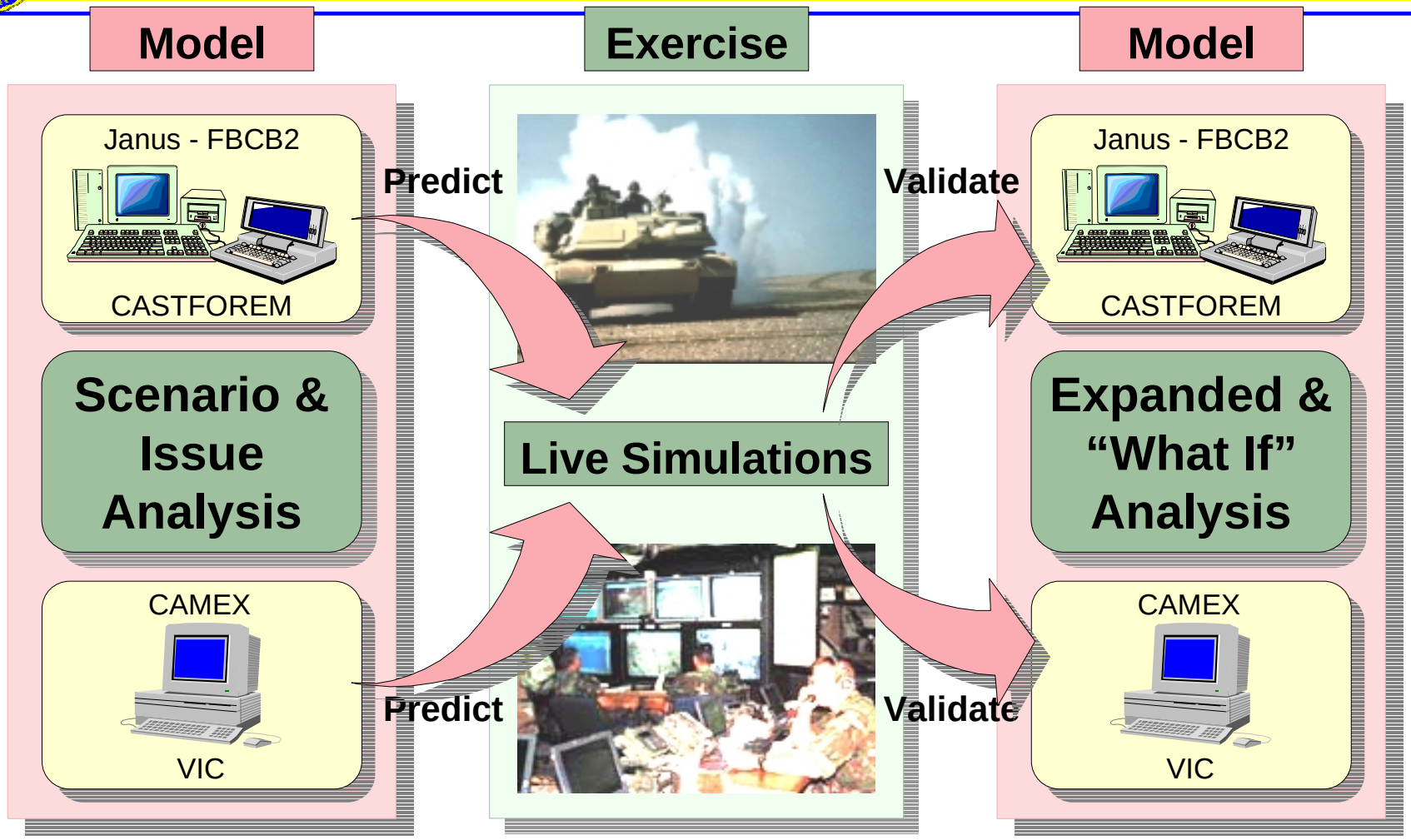
Unprecedented Collaboration

Leaders--Warriors--Industry--Developers--Testers

The *Calculus* of Operations Analysis

3rd Order Conclusions **based on strongly predictive methodologies**	✓ Full experimental design ✓ Controlled variables ✓ Certified model algorithms and data, classified if necessary ✓ Statistical confidence limits
1st Order Insights **based on quantitative and qualitative analysis**	✓ Incomplete experimental design ✓ Surrogated data ✓ Structured exercise AARs and soldier-in-loop simulation results ✓ Inferred causality
PMJ **Professional Military Judgement of SMEs**	✓ Relevant military experience ✓ Operations lessons learned ✓ Historical precedent ✓ Training AARs

Experiment M-E-M Protocol



Assist train-up

Design live scenario

Screen issues

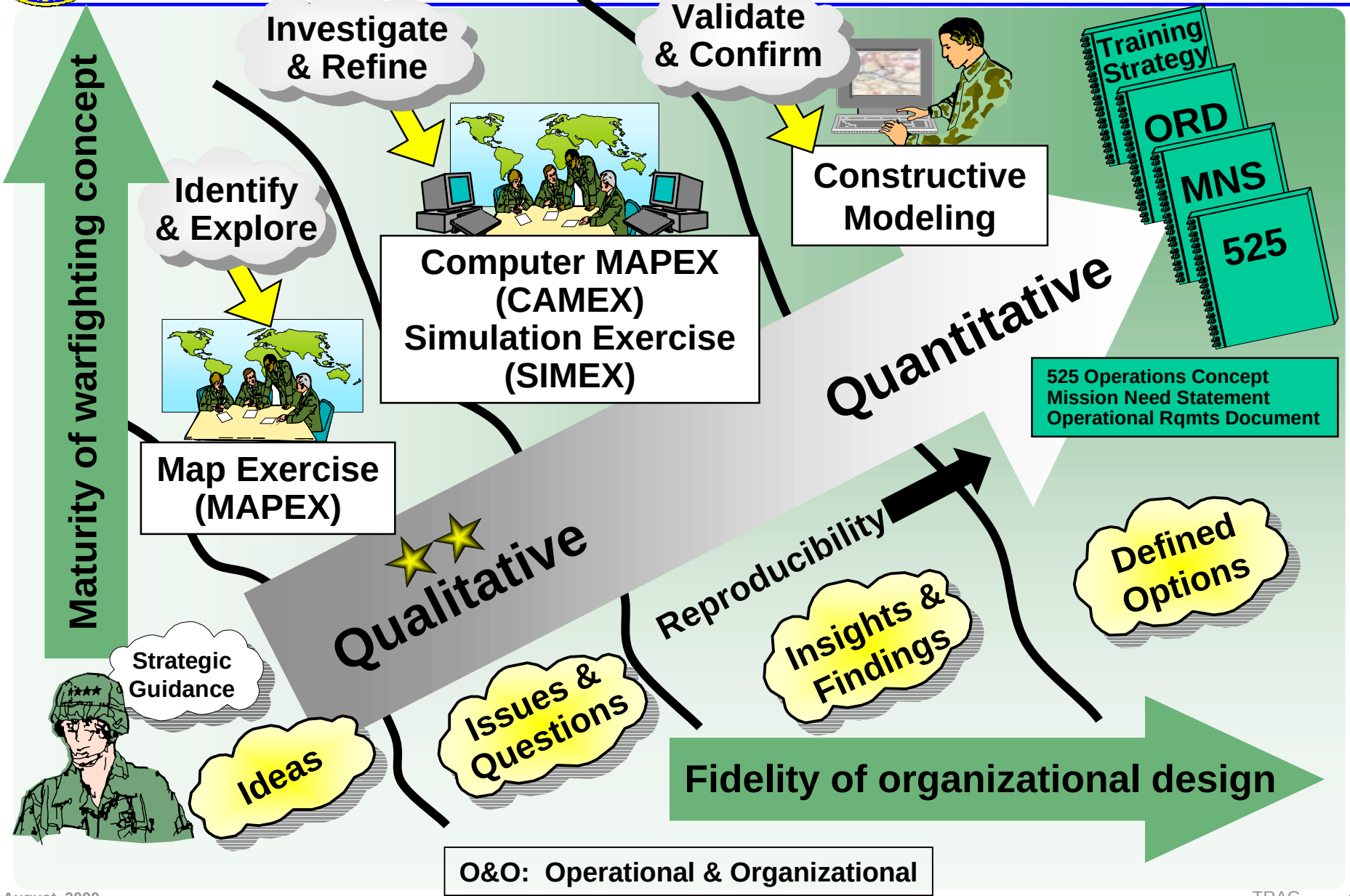
Focus data collection

Enhance live play with simulation/stimulation

Extend experiment beyond live conditions

Pinpoint causality with higher confidence

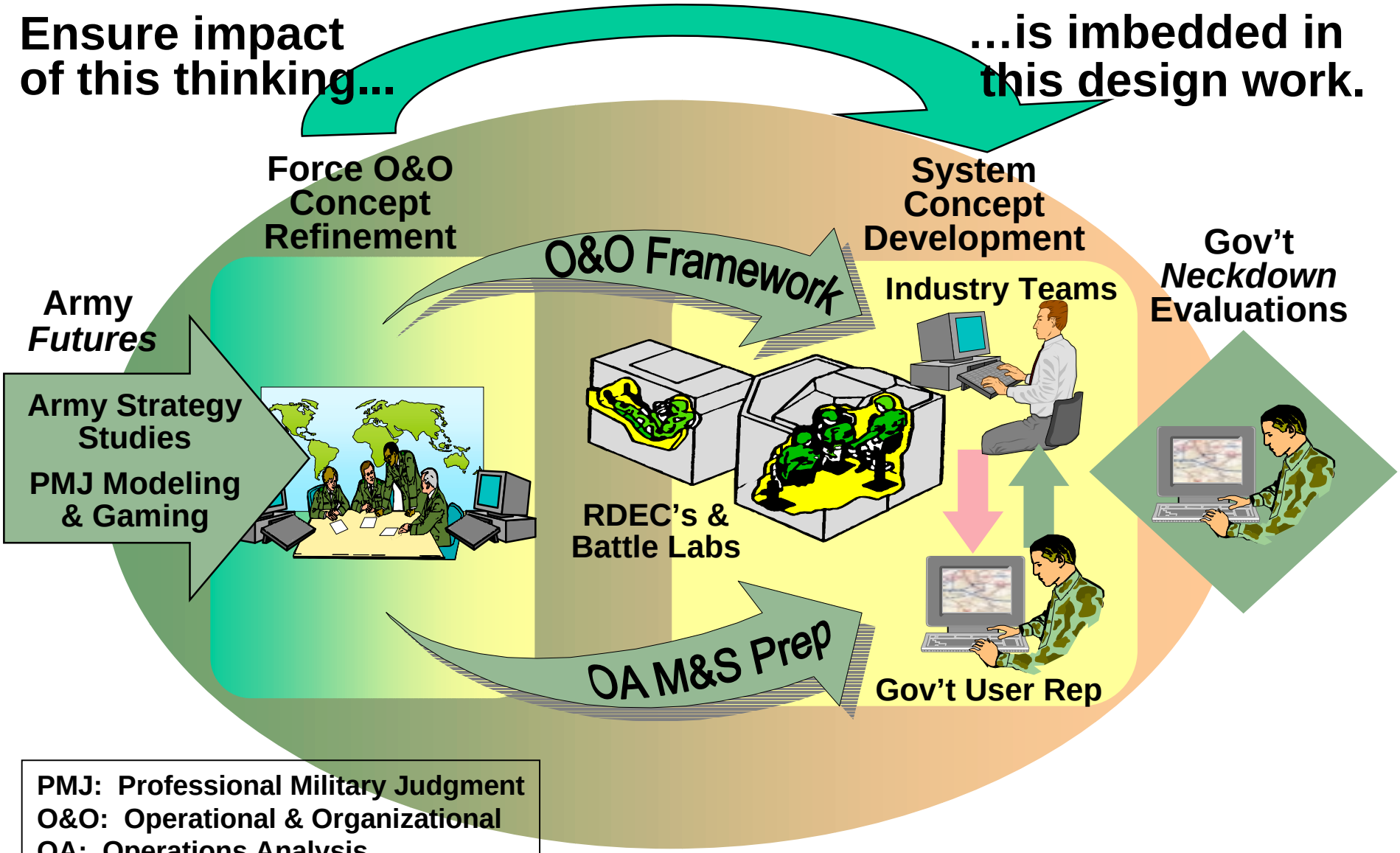
Concept-to-Requirements



Future Combat System Collaboration

Ensure impact of this thinking...

...is imbedded in this design work.

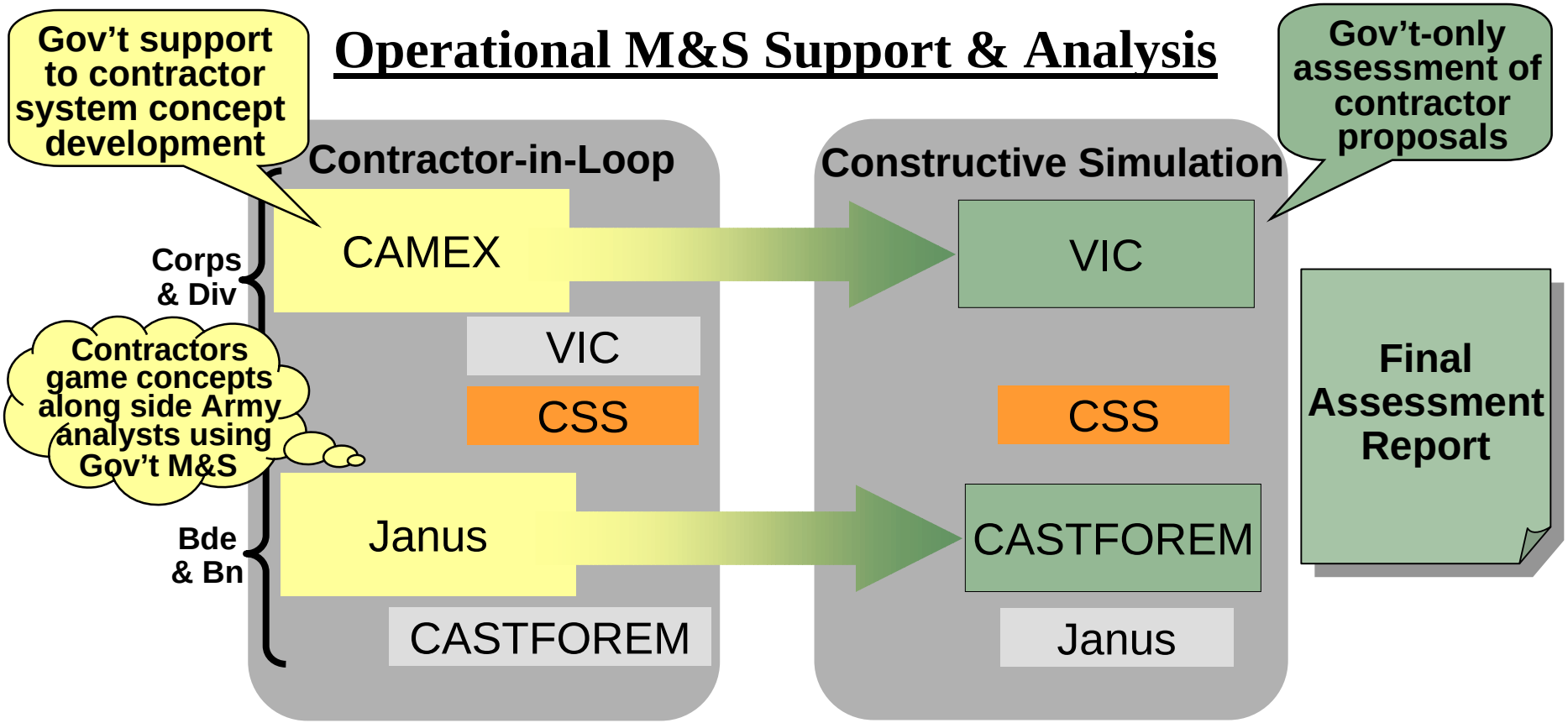


PMJ: Professional Military Judgment
O&O: Operational & Organizational
OA: Operations Analysis

FCS Ops Analysis & M&S Collaboration

Concept Development Phase | **Gov't Assessment Phase**

Technical M&S Support & Analysis	Gov't Technical Analysis



Modeling Challenges

✔ Insufficient knowledge base to accurately model operations in urban and complex terrain.

- Target acquisition and identification.
- Adjudication of fires.
- Tactical communication.
- Human behavior (all sides).

✔ Lack of human behavior models (especially for command decision making).

✔ Some headway made, but still largely a work-in-progress on methods to model and measure value of information in military ops.

Infrastructure Roadblocks

✔ **Unable to share sensitive data necessary to create collaborative simulation environments.**

Proprietary system data

Intelligence data (basis of scenarios)

✔ **Inadequate life cycle management of data for M&S to serve DoD-wide needs.**

Data *generation*: Expansion and leverage of JTCG-ME is promising.

Data *management*: JDS has potential.

Data *standards*: "Data dictionary" is DOA.

Big Impediments to Collaboration Necessary for SBA & SMART